

Appl. No. : 10/782,727
Filed : February 18, 2004

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REMARKS

In response to the Final Office Action mailed August 28, 2006, Applicant respectfully requests that the above-referenced application be reconsidered in light of the following comments.

Drawings and Claim rejections under 35 U.S.C. 112

The Examiner has objected to the drawing for not showing the following features recited in the claims: gas outlet, first apertures, first passages, second passages, second apertures, third apertures, first distributor passages, grooves, recess, wafer handler, first and second holes, first flow path, second flow path, first bore, and second bore.

The Examiner has also rejected claims 1-43 under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement apparently for failing to the terms recited above in the specification.

To advance prosecution, in the previous Amendment, Applicant amended the Specification to provide more explicit antecedent basis for the terms mentioned above. As noted in the previous Amendment, these terms were in the original claims and, therefore, no new matter has been added.

Nevertheless, the Examiner continues to object to the drawings and to reject the claims under 35 U.S.C. 112, first paragraph. Applicant respectfully traverses this rejection.

The Examiner argues at paragraph 13 of the Final Office Action "that Applicant has claimed a grand total of sixteen (16) claim elements that are not described in or supported by Applicant's original disclosure as filed." This is not correct. The claim elements noted above *are in the original claims, which are part of the original disclosure as filed*. The Examiner is respectfully directed to M.P.E.P. 608.01(1) which states that the "applicant may rely not only on the description and drawing as filed but also on the **original claims....**" (emphasis added)

Section 608.01(1) also states that:

Where subject matter not shown in the drawing or described in the description is claimed in the application as filed, and such original claim itself constitutes a clear disclosure of this subject matter, then the claim should be treated on its merits, and requirement made to amend the drawing and description to show this subject matter. **The claim should not be attacked either by objection or rejection because this subject matter is lacking in the drawing**

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and description. It is the drawing and description that are defective, not the claim. (emphasis added)

As noted above, in the previous Amendment, Applicant amended the Specification to provide antecedent basis in the Specification for the noted claim language. In addition, Applicant has noted that each of these claim limitations can be in the drawings. Thus, any defects in the drawings or specifications have been cured. Accordingly, Applicant has complied with the requirements of M.P.E.P. 608.01(I) and Applicant request that this objection to the drawings and this rejection of the claims be withdrawn.

Double Patenting Rejection

Claims 1-43 stand provisionally rejected on the ground of non-statutory obviousness-type double patenting as being unpatentable over claims 1-43 of co-pending Application No. 10/428,207. Applicant notes that this co-pending application is under appeal. Thus, Applicant respectfully requests that per USPTO procedures this rejection be held in abeyance until one of the two applications issues.

Claim Rejections under 102(b) and 103(a)

Claims 1-9, 11, 13, 16, 18, 20, 21, 30-32, 34-36 and 39-42 stand rejected under 35 U.S.C. 102(b) as anticipated by Hemming (USPN 6,025,013). Claims 10, 12, 22-29, 33, 37, 38 and 43 stand rejected under 35 U.S.C. 103(a) as unpatentable over Hemming and view of Oda (USPN 5,010,842). Claims 14 and 15 stand rejected as unpatentable over Hemming in view of Kobayashi. Claims 17 and 19 stand rejected as obvious over Hemming and Olgado. For the reasons set forth below, Applicant respectfully traverses the rejection of these claims.

As noted in the previous response, the primary reference Hemming discloses a schematic illustration (Figure 1) of a plasma CVD device. The device includes a gas section nozzle 10 with four presumably concentric sections 13, 14, 15, 16. See e.g., FIGS. 7a and 7b and the deformable cylinder 54. The outer exhaust section 16 is positioned on the outside of the sections 13, 14, 15 for the feed gases. Thus, Hemming merely discloses a plurality of concentric cylinders which are capped by a plate 12 with holes.

Oda merely discloses a combination of pipes 20a. Moreover, the exhaust path in Oda is located below the pipes 20a.

With respect to the independent claims, Claim 1 is rejected as anticipated by Hemming and recites, in part, "a gas exchange plate" which includes "a plurality of first passages

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machined therein being in fluid communication with a first reactant gas source and a purge gas source, the first passages communicating with a plurality of first apertures spaced along the first passages, the first apertures opening to the reaction space; a plurality of second passages **machined therein** being in fluid communication with a second reactant gas source and a purge gas source, the second passages communicating with a plurality of second apertures spaced along the second passages, the second apertures opening to the reaction space; and a plurality of third apertures extending from the first side to the second side of the gas exchange plate, allowing gas to pass therethrough."

At paragraph 16, the Examiner states that "a plurality of centric cylinders which are capped by a plate 12 with holes' is not a feature that reads away from Applicant's claimed invention." Applicant disagrees. Hemming does not disclose a plate with a plurality of first and second passages **machined therein** and first and second apertures communicating with the first and second passages as recited in Claim 1. That is, the concentric cylinders are not a plate with machined first and second passages machined therein. The Examiner at page 5 cites Figure 1, structure 11-15 and column 11, lines 10-30 but there is simply no disclosure in these sections of Hemming of the plate with the machined passages as recited herein. Thus, Hemming can not anticipate Claim 1. Similarly, the pipes of Oda also do not comprise a plate with first and second passages machined therein.

Claim 26 is rejected as obvious over Hemming in view of Oda and recites, in part, "a first plate a first plate positioned above the substrate support, the first plate having: a first gas inlet fluidly connected to a first plurality of apertures via a first gas pathway; a second gas inlet fluidly connected to a second plurality of apertures via a second gas pathway, wherein the first and second pathways are **machined** into the first plate; a third plurality of apertures allowing gas to pass through the first plate." Claim 26 also recites "a second plate fixed to a gas outlet, positioned above the first plate, having a plurality of apertures allowing gas existing between the first plate and the second plate to flow to the gas outlet."

At page 16, the Examiner states that Hemming discloses the above noted features. However, again, Applicant respectfully submits that neither Hemming nor Oda discloses a first plate with first and second passages machined therein. Hemming and Oda also do not disclose "a second plate positioned above the first plate having a plurality of apertures along gas existing between the first and second plate to flow to the gas outlet." The Examiner identifies structure

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10 in Hemming which is identified as a gas section nozzle, and is not a plate as recited in Claim 26.

Also rejected as obvious over Hemming in view of Oda is Claim 27, which recites, in part, "a gas exchange plate having a thickness between a first side and a second side, the gas exchange plate defining a first network of passages in fluid communication with a first gas inlet and a second network of passages in fluid communication with a second gas inlet, the first and second network of passages including a plurality of first and second apertures opening from the first and second network of passages, respectively, to the second side of the gas exchange plate, the first and second apertures being interspersed and spaced across the second side of the gas exchange plate, the gas exchange plate further including a plurality of third apertures extending from the first side to the second side through the thickness of the gas exchange plate and being isolated from the first and second network of passages."

With respect to the limitation that the first and second apertures are "interspersed", the Examiner cites at page 17 to top of 15, Figure 1 and column 11, lines 10-30. However, Applicant does not find any disclosure or suggestion of interspersing apertures that are in communication with different networks of passages as recited in this claim. Again, the Examiner has not provided a *prima facie* case of obviousness by identifying a combination of references that disclose, teach or suggest all of the limitations of the claims.

Claim 34 recites in part a showerhead plate "having a first flow path through the showerhead plate, the first flow path including a plurality of first apertures opening to the second side of the showerhead plate; a second flow path through the showerhead plate, the second flow path isolated from the first flow path within the plate, the second flow path including a plurality of second apertures opening to the second side of the showerhead plate; and a plurality of third apertures extending through the showerhead plate, the third apertures isolated from the first and second flow paths within the showerhead plate."

With respect to the limitation that the first and second flow paths are isolated from each other in within the plate, the Examiner again at page 11 simply cites to the gas nozzle structure 10 and 11 of Hemming. As noted above, Applicant submits that this does not meet the claim limitations of this claim.

The remaining claims depend either directly or indirectly on one of the independent claims discussed above. For at least this reason, these claims are also in condition for allowance.

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In general, Applicant respectfully submit that the Examiner is unreasonably disregarding several limitations in the claims and/or reading limitations so broadly that they simply have no meaning. As stated in M.P.E.P. 2111, "the pending claims must be given therein broadest reasonable interpretation consistent with the specification." (emphasis added). The broadest reasonable interpretation of the claims must also be consistent with the interpretation that those skilled in the art would reach. *Id.*

Applicant respectfully submits that the Examiner is simply ignoring claim limitations such as "plate", "interspersed", "within", and "machined therein" and not giving them an interpretation that is reasonable and consistent with the specification.

As discussed in the Application (see e.g., paragraphs 80-83 of the published application), in one preferred embodiment, the construction of the ALD reactor produces certain benefits. For example, the gas exchange plate and gas exhaust plate structures as claimed are simple and cheap to manufacture. They may be configured so that they are suitable as consumable items for after sales marketing. By providing a single plate with passages and apertures machined therein, the gas exchange plate is replaceable and is preferably cleaned or even discarded when deposition buildup results in less than optimal operation. Similarly, the gas exhaust plate structure is also replaceable. When deposition and other unwanted residue builds up in the gas exhaust plate apertures, the customer may replace the used gas exhaust plate with a cleaned one or a new one as well.

Additionally because the gas exchange plate is a replaceable part inside the reaction chamber, the customer can select an exchange plate structure that meets specific needs. For example, the size, the number and the location of the apertures can be optimized so that the whole wafer will be exposed uniformly to the reactant gas. Advantageously, the entire chamber does not require disassembly in order to replace the gas exchange plate; rather, the chamber can simply be opened and the gas exchange plate can be readily replaced with minimal reactor downtime and minimal re-tuning after replacement.

CONCLUSION

For the foregoing reasons, it is respectfully submitted that the rejections set forth in the outstanding Office Action are inapplicable to the present claims. Accordingly, early issuance of a Notice of Allowance is most earnestly solicited.

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The undersigned has made a good faith effort to respond to all of the rejections in the case and to place the claims in condition for immediate allowance. Nevertheless, if any undeveloped issues remain or if any issues require clarification, the Examiner is respectfully requested to call Applicant's attorney in order to resolve such issue promptly.

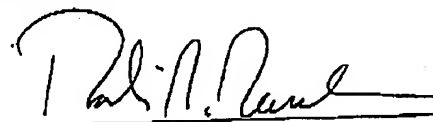
Please charge any additional fees, including any fees for additional extension of time, or credit overpayment to Deposit Account No. 11-1410.

Respectfully submitted,

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